



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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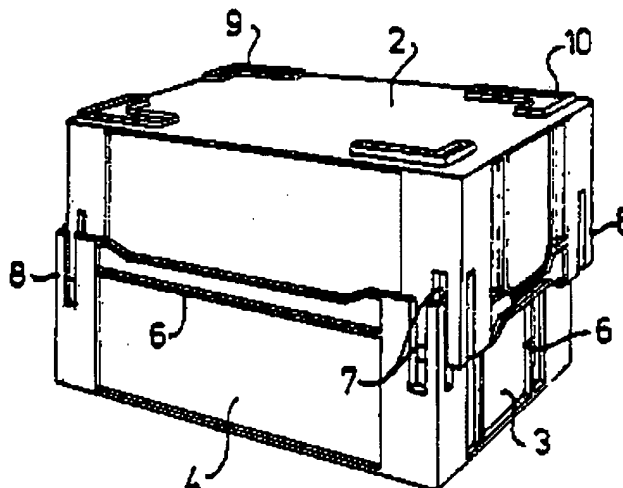
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(54) Title: NESTABLE CONTAINER



## (57) Abstract

A crate (1) is provided with a bottom (2) with upright front walls (3) and sidewalls (4) connecting thereto. For nesting purposes in pairs, the front walls (3) and sidewalls (4) are provided with slits (7). These slits run from the top edge of the crate (1) towards the bottom. The bottom is further provided with locking elements (9, 10) for shift-free stacking of nested pairs of crates.

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Title: Nestable container.

The invention relates to a container with a preferably rectangular bottom and upright front and side walls connecting thereto.

Such open-top containers, such as crates, are used for, for  
5 example, packing and transporting bulk or loose goods, such as tubarous or bulbous plants. Such crates are stacked on top of each other by placing the bottom of the next crate on the open top edge of the previous crate. For the greatest possible stacking height with the most efficient material use possible, combined with the optimum ratio between the  
10 internal volume and the external cubic measurements, it is necessary in this connection that in a stack of crates the upright front and side walls run vertically as far as possible, since these walls are subjected to pressure. Such crates with rectangular flat bottom and side walls perpendicular thereto, made of, for example, wood or plastic, have  
15 already been in use in large quantities for many purposes for a long time. The disadvantage of these known crates is that when they are stacked empty they take up as much space as when they are full. This is a disadvantage as regards, for example, the required storage space for empty crates or transporting them.

20 The object of the invention is to overcome this abovementioned disadvantage. For this purpose, the invention provides a container with a preferably rectangular bottom and upright front and side walls connecting thereto, in which in at least one front or side wall there is a slit running over at least a part of the height of the container, from the  
25 free top edge of the wall concerned to the bottom, which slit is open at the top edge and is provided over the full wall thickness, and which slit is of such width that a suitable part of a wall of a second container which is nestable with the first container can be pushed into said slit.

Such containers according to the invention can easily be nested  
30 in pairs, with the result that the space taken up by empty containers compared with full ones is almost halved. Despite these nestable properties, the stacking strength and ease of handling of the known container are maintained, without additional measures having to be taken for the purpose. This means that it is possible, for example, to use  
35 existing containers and containers according to the present invention with the same dimensions interchangeably for normal applications, such as stacking filled containers on top of each other.

In certain embodiments of the invention it is even possible to

a limited degree to nest a container according to the present invention with a conventional container with corresponding measurements.

The slits preferably extend over approximately half the height of the container, each upright wall being provided with two slits, each  
5 in the corners of the container where the side walls connect to each other. This makes it as easy as possible for the containers to fit into each other during nesting.

It is also preferable to provide locking elements on the side of the bottom of the container facing away from the upright walls. These  
10 locking elements must be fitted in such a way that it is made virtually impossible for two containers according to the present invention placed with their bottoms against each other to shift relative to each other. This ensures that container pairs which are nested together can be  
15 efficiently and reliably stacked on top of each other for, for example, transport and/or storage. For this purpose, such locking elements are preferably made rib-shaped and fitted on the bottom in pairs of concentric annular patterns with the lengthwise direction of the locking  
20 elements in the direction of the pattern. Per pair these annular patterns preferably have a space between them which is essentially the width of said ribs. For good functioning, the locking elements for each pattern pair must not lie next to each other. This will become clear from the description of the figures.

The bottom can also be provided with conventional second locking elements for stacking the containers efficiently and reliably  
25 with the bottoms on the top edges. The first and/or second locking elements at the same time provide an effective supporting face and provide protection at the bottom, for example when the container is placed on a rough surface.

Nestable containers of the type described in the introduction  
30 are known per se. However, such known nestable containers have very sloping side and front walls, which means that the container tapers towards the bottom. Such containers can be nested in virtually unlimited numbers. However, the sloping walls mean that the stacking strength of such containers is relatively low, and the ratio between the internal  
35 volume and the external cubic measurements is poor. Moreover, additional measures are necessary to make such containers stackable on top of each other.

The invention will be explained in further detail below on the basis of a non-limiting example of an embodiment, with reference to the

appended figures, in which:

Fig. 1 shows a perspective view of a preferred embodiment of the container according to the invention;

Fig. 2 shows a perspective view of two containers according to Fig. 1 nested in each other;

Fig. 3 shows a bottom view of the container of Fig. 1.

With reference to the figures, the invention is explained further on the basis of a generally known container in the form of crate 1. This crate 1 has a flat, rectangular bottom 2 with upright front walls 3 and side walls 4 connecting thereto. Grips 5 are provided in the front walls 3. This crate 1 is manufactured by injection-moulding, and for this purpose the walls 3, 4 are made double-walled near the corners where they join each other, while reinforcing ribs 6 run in the remaining, single-walled areas.

In the corners of the crate, where the front walls 3 connect to the side walls 4, slits 7 are provided in the walls 3, 4, running from the top edge of the crate 1 towards the bottom 2, and extending over the full wall thickness. As shown, these slits run essentially over half the height of the crate 1. The slits 7 of two adjacent walls 3, 4 bound a vertical corner leg 8.

Due to the fact that the crate 1 is provided with slits 7, two crates 1 can be nested in one another, as shown in Fig. 2. In this connection, the side wall 4 of one crate 1 slides into the slit 7 in the front wall 3 of the other crate 1, and vice versa. The crates can be pushed into each other so far here that the bottom 2 of one crate is approximately flush with the top edge of the walls 4 of the other crate 1 (not shown).

As can be seen in Figs. 2 and 3, the bottom 2 is also provided with rib-shaped locking elements 9, 10. These locking elements 9 and 10, respectively, lie on imaginary concentric annular patterns 11 and 12, respectively, which form two pairs of rings. Each pair of rings is in each case separated from the other by approximately the width of a locking element 9, 10. The fact that the locking elements 9, 10 are disposed alternately on, for example, the outer pair of rings, in a mirror-symmetrical fashion, means that the locking elements 9 of one crate are enclosed by the locking elements 10 of another crate when two crates are placed with the bottoms on each other. Crates stacked on top of each other in this way cannot shift relative to each other.

Of course, variants of the exemplary embodiment described here

are conceivable. For example, it is not absolutely essential to provide all front and side walls of the crate with the slits according to the invention. One front wall 3 and one side wall 4 can each be provided with a slit 7, so that a crate 1 has only two slits, these slits lying  
5 approximately diagonally opposite each other. Nesting will, however, in that case take longer, due to the fact that the various crates then have to be turned more often into the correct position. It is also possible to omit the upright element 8. The side and front walls then have common  
10 slits 7. It is also possible, for example, to make the slits 7 run right to the bottom 2. As a result of this, crates not provided with the slits 7 according to the invention could also be nested together with a crate according to the invention having corresponding measurements. However, such a far-running slit adversely affects the strength of the crate. In  
15 order to limit the width of the slit, it is possible, for example, for the appropriate region of the wall which is pushed into the slit to be made thinner.

Variants of the locking elements 9, 10 shown are also conceivable. For example, it is possible to make do with fewer locking  
20 elements by, for example, omitting those which lie on the innermost pair of concentric annular patterns 11, 12. The locking elements can also have recesses in the bottom 2, into which projections on a following bottom can slot.

Finally, the side walls 4, for example, can be lowered further in their central region, for example for the storage and transport of  
25 vegetables and/or fruit. Moreover, it is not absolutely essential for bottom and wall to be closed, but they can be provided with cutouts (holes) of different shapes and/or dimensions, depending on the product to be packed and the desired degree of ventilation. A crate or container with a round base shape could also be considered for the application of  
30 the invention. In addition, it is, of course, not absolutely essential for the front and side walls to be perpendicular to the bottom.

The scope of the invention is therefore determined more by the appended claims.

CLAIMS

1. Container (1) with a preferably rectangular bottom (2) and upright front (3) and side (4) walls connecting thereto, in which in at least one front or side wall there is a slit (7) running over at least a  
5 part of the height of the container (1), from the free top edge of the wall concerned towards the bottom, which slit is open at said top edge and is provided over the full wall thickness, and which slit is of such width that a suitable part of a wall of a second container which is nestable with the first container can be pushed into said slit.
- 10 2. Container according to Claim 1, in which the slits (7) extend approximately over half the height the container (1).
3. Container according to Claim 1 or 2, in which the slits (7) lie essentially diagonally opposite each other relative to the base of the container.
- 15 4. Container according to one of the preceding claims, in which the slits (7) lie in the vicinity of the places where the upright walls (3, 4) connect to each other.
5. Container according to one of the preceding claims, in which each upright wall (3, 4) of the container (1) is provided with two of  
20 said slits (7) which are spaced apart.
6. Container according to Claim 4 or 5, in which said slits (7) of two adjacent upright walls (3, 4) are common.
7. Container according to one of the preceding claims, in which at the side of the container facing away from the upright walls the bottom  
25 (2) is provided with first (9, 10) and/or second locking elements which can interact with locking elements on the bottom or the top edge of the next container placed therewith against said bottom, in order to prevent the two containers from shifting relative to each other.
8. Container according to Claim 7, in which the first locking  
30 elements (9, 10) which interact with locking elements on the bottom (2) of the next container placed with the bottom against said bottom are situated on one or more concentric annular patterns (11, 12).
9. Container according to Claim 7 or 8, in which the locking elements (9, 10) are rib-shaped and run with their lengthwise direction  
35 parallel to the abovementioned annular patterns (11, 12).
10. Container according to one of the preceding Claims 7 to 9, in which the first locking elements (9, 10) are situated on at least two concentric annular patterns (11, 12) lying at a distance from each other

which is essentially the width of the first locking elements, and in which the first locking elements are disposed alternately on said patterns.

11. Container according to one of the preceding Claims 7 to 10, in which the abovementioned second locking elements are situated on and arranged in an annular pattern which lies concentrically with the annular pattern on which the top edge of the container lies, and lies at a distance from said pattern which is essentially the thickness of the top edge of the container.
- 10 12. Combination of two containers according to one of the preceding claims, in which the containers are pushed into each other with the bottoms facing away from each other, through the upright walls of one container being pushed into the corresponding slits in the upright walls of the other container.



fig -1

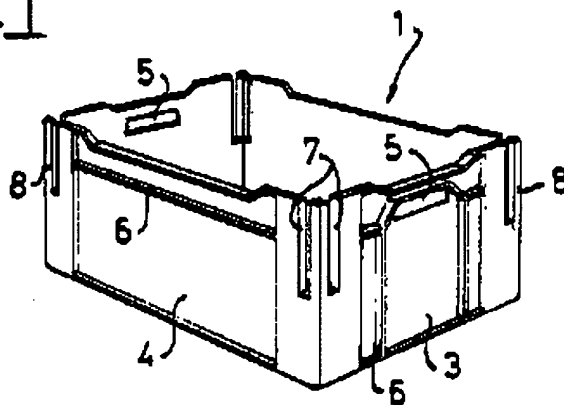


fig -2

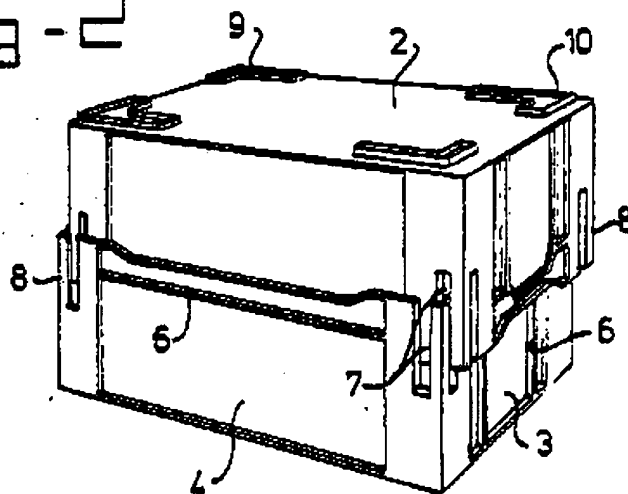
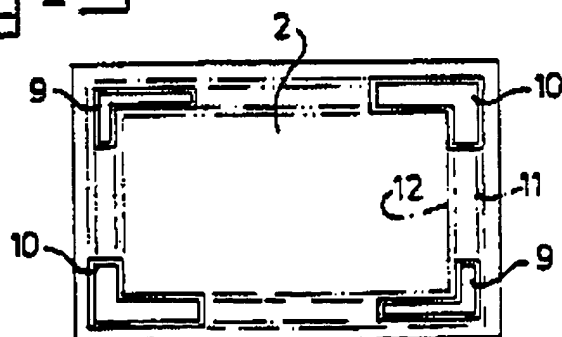


fig -3



## INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 92/00219

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) <sup>6</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 B65D21/02		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
Int.Cl. 5	B65D	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched <sup>8</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup></b>		
Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
X	FR,A,2 527 172 (J. PALMASON) 25 November 1983	1-4,6,12
Y	see page 3, paragraph 5 - page 4, paragraph 2; figures 1-3 ---	5,7-11
Y	WO,A,9 005 679 (REHRIG PACIFIC CO.) 31 May 1990 see page 5, paragraph 7 - page 6, paragraph 1; figures 1,4,5 ---	5
Y	FR,A,2 170 242 (GEORG UTZ AG) 14 September 1973 see page 1, line 31 - page 3, line 14; figures 1,2,5 ---	7-11
X	AT,A,382 581 (K. HIRSCH GMBH) 10 March 1987 see the whole document -----	1-4
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<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
31 MARCH 1993	16.04.93	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	PERNICE C.	

Form PCT/ISA/210 (second sheet) (January 1983)

**ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO.**

NL 9200219  
SA 68575

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